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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Field of the Invention]This invention relates to the optical disc which can attain densification of information storage especially about the optical disc corresponding to the land/groove which records information on a land and a groove.

**[0002]**

[Description of the Prior Art]High random access is possible for an optical disc, and bulk memory-ization can be attained, it has further the advantage of excelling in the preservability of a medium, and the endurance of the medium by non-contact, and being widely used for a next-generation recorder is expected.

[0003]As a conventional optical disc, the rewritten type optical disc which aimed at improvement in C/N of a reproduced information signal was proposed, for example by recording information on a land by JP,4-172623,A. Drawing 4 is an enlarged drawing showing the groove and land of an optical disc concerning the first conventional example (JP,4-172623,A).

[0004]In the figure, in the diameter direction of the optical disc 100. The groove 101 and the land 102 are formed by turns, and it had composition which records the track address of the land 102 used as a recording track by making each side walls 101a of these grooves 101, and the 101b perimeter crooked (wobbling).

[0005]On each wall surfaces 101a and 101b of the groove 101,101 which sandwiches the land 102 used as an odd numbered track here. While recording the odd number track address, the even number track address was recorded on each wall surfaces 101a and 101b of the groove 101,101 which sandwiches the land 102 used as an even numbered track.

[0006]In the optical disc 100 which consists of the above-mentioned composition, the photo detector which has the element which irradiated the land 102 with the beam for

record/playback, and was divided into two in the reflected beam was entered (not shown), and the track-address signal had been acquired from the regenerative signal in which this photo detector carried out differential detection. By this, the optical beam could be made to land to the target track address, the information storage mark 105 was formed on the land 102, and record reproduction of information was performed.

[0007] Drawing 5 is an enlarged drawing showing the groove and land of an optical disc of a single-sided wobbling method concerning the second conventional example. This optical disc 200 was considered as the composition which records the track address of the groove 201 and the land 202 used as a recording track by making the one side wall perimeter of the groove 201 crooked (Japan Society of Applied Physics national conference 1995 spring 28 a-T-1pp.1025).

[0008] In the optical disc 200 which consists of the above-mentioned composition, whenever the optical disc 200 goes around, by irradiating the groove 201 and the land 202 with the beam 203,204 for record/playback by turns, The track address recorded on the one side wall of the groove 201 was shared to the groove 201 of the couple located in the both sides of said one side wall, and detection of the track address of the land 202.

[0009] Thereby, the track address of both the groove 201 and the land 202 could be detected in the amount of wobbling amplitude of around about 20 nm, and densification of information storage was able to be attained.

[0010] The optical disc 300 concerning the third conventional example shown in drawing 6, In CAV (Constant angular Velocity) rotation mode or CLV (Constant Linear Velocity) rotation mode, By forming the mark 303a in the field 303 established in some tracks, it had composition which records a track address. The mark 303a is formed in the land 301 on the field 303, and the corresponding position in the figure.

[0011]

[Problem(s) to be Solved by the Invention] However, in the optical disc 100 concerning the first conventional example mentioned above, since it had composition which records information only on the land 102 and does not record information on the groove 101, there was a problem that the storage density of an optical disc was very low.

[0012] Since it had composition to which wobbling of each side walls 101a and 101b of the groove 101 is carried out, In consideration of the amount of wobbling amplitude of each side walls 101a and 101b, the wide width of the groove 101 and the land 102 had to be taken, respectively, and this was reducing the storage density of the optical disc further.

[0013] Since wobbling of the perimeter of each side walls 101a and 101b of the groove 101 was carried out, The information (information signal) recorded on the land 102 and the track address (wobble signal) recorded on each side walls 101a and 101b of the groove 101 will be reproduced simultaneously, If the frequency band of the wobble signal was not made into the

information signal and the thing in which it does not interfere, there was also a problem that detection of the stable track address and reproduction of information could not be performed. [0014]On the other hand, with the optical disc 200 of the single-sided wobbling method concerning the second conventional example, since information was recorded on both the groove 201 and the land 202, information storage higher-density than the above-mentioned optical disc 100 was possible, but. In consideration of the amount of wobbling amplitude of around about 20 nm, the wide width of the groove 201 and the land 202 had to be taken, and there was a problem that this had barred densification.

[0015]Since it has composition to which wobbling of the perimeter of the one side wall of the groove 201 is carried out and the beam 203,204 for record/reproduction straddles the groove 201/the land 202, it will be detected to the modulation components of the diffracted light of not only optical signal detection but the groove 201/the land 202. For this reason, there was also a problem that it will wave [ of record/reproduction ] with a wobble signal, envelope change of a regenerative signal became large as a result, and record/reproduction of the stable information could not be performed.

[0016]When it is satisfactory when it has composition which records information only on the land 302 in the optical disc concerning the third conventional example, but it has composition which records information on the groove 301 and the land 302, The beam 304 which reproduces the information recorded on the groove 301 will reproduce simultaneously the mark 303a which shows two different track addresses, The track address of the groove 301 and the land 302 could not be detected, but there was a problem that information was recordable on either the groove 301 or the land 302, after all.

[0017]This invention aims at detection of the track address which was made in view of the above-mentioned problem, and could attain densification of information storage, and was stabilized, and offer of the optical disc which can perform record/playback of information.

[0018]

[Means for Solving the Problem]To achieve the above objects, the optical disc according to claim 1, In an optical disc which used both a groove and a land as a recording track of information, it has composition which formed a field which does not record information on said groove and said land, and formed prepit for track-address detection in a one side wall or each side walls of said groove in this field.

[0019]When reproducing information which recorded or recorded information on said groove and said land according to such composition, a track address of said groove and said land can be detected by irradiating said prepit with a part of beam for record/reproduction.

[0020]By having had composition which provides a field for exclusive use and forms said prepit, it becomes unnecessary to take into consideration the amount of wobbling amplitude in conventional technology, and said groove and said width of land can be formed narrowly. This

enables it to raise storage density of a diameter direction of an optical disc.

[0021]Since a recording position of information in said groove and said land and a formation position of said prepit are changed, At the time of reproduction of information, it becomes possible for an information signal and a regenerative signal of a tracking address not to interfere, and to perform stable detection of a track address, and record/reproduction of information.

[0022]The optical disc according to claim 2 is considered as composition which made said groove and said width of land 40% - 80% of diameters of a beam for record or playback.

According to such composition, said prepit can be made to be able to irradiate with a part of beam for record/playback certainly, and said groove and said width of land can be narrowed, and densification of an optical disc can be attained.

[0023]

[Embodyment of the Invention]Hereafter, it explains, referring to drawings for one embodiment of the optical disc of this invention. Drawing 1 is a perspective view showing the optical disc concerning the embodyment of this invention. Drawing 2 is a top view showing the groove and land of the above-mentioned optical disc, and drawing 3 is an A-A sectional view of drawing 2.

[0024]In these drawings, in the diameter direction of the optical disc 10. The concentric or spiral groove 20 and the land 30 (the field which drew the slash of drawing 2 is said) which adjoins this groove 20 are formed, and both these grooves 20 and the land 30 are used as a recording track of information from a viewpoint of the densification of information storage.

[0025]The field (sector) which does not record information as shown in drawing 2 is established in a part of groove 20 and land 30, and the prepit 21 for detecting the track address of each groove 20 and the land 30 to the one side wall of each groove 20 in this field is formed. a group formed in the one side wall of each groove 20 -- the track address common to the groove 20 and the land 30 of the couple located in the both sides of this prepit 21 is recorded on the prepit 21.

[0026]Here, the groove 20, the prepit 21, and the land 30 are formed in the following procedures.

\*\* forming a photoresist layer in the glass original recording of the optical disc 10 -- \*\* -- by irradiating with \*\* one beam for record continuously, moving two beams for record which overlap mutually with constant speed to the radial direction of the optical disc 10, While forming the groove 20 and the land 30, the prepit 21 is formed in the one side wall of the groove 20 by irradiating with the beam for record of \*\* another side intermittently according to a track address.

[0027]In this embodiment, width of the groove 20 and the land 30 is made into 40% - 80% of the diameters of the beams 41 and 42 for record/reproduction. Both the beams 41 and 42 for record/reproduction are Gaussian beams, and serve as a beam diameter which becomes  $e^{-2}$

of main intensity.

[0028]Next, the tracking operation of the above-mentioned optical disc is explained, referring to drawing 2 and drawing 3.

[0029]When reproducing the information which recorded information on the groove 20 or was recorded on the groove 20, The whole width of the groove 20 is irradiated with the beam 41 for record/reproduction for the prepit 21, and this beam 41 for record/reproduction detects the tracking address of the groove 20 based on the catoptric light from the prepit 21 when it passes through the field shown in drawing 2.

[0030]On the other hand, information is recorded on the land 30, Or when reproducing the information recorded on the land 30, The whole width of the land 30 containing the prepit 21 is irradiated with the beam 42 for record/reproduction, and this beam 41 for record/reproduction detects the tracking address of the land 30 based on the catoptric light from the prepit 21 when it passes through the field shown in drawing 2.

[0031]Therefore, in the above-mentioned optical disc 10, tracking of the recording track used as a target can be carried out by changing the tracking servo of the groove 20 and the land 30.

[0032]In this case, as the method of the tracking in the above-mentioned optical disc 10, \*\* What is made to scan toward the outside from the inside of the optical disc 10, records the beam for record reproduction, / plays the groove 20 and the land 30 by turns, Or after recording toward the outside from the inside of the \*\* optical disc 10, / playing only the land 30, the beam for record reproduction is again returned inside the optical disc 10, and what records toward the outside from the inside, / plays only the groove 20 can be considered.

[0033]The direction used as the one side wall of the groove 20 with the composition which forms the prepit 21 even when the method of a gap to mention above was enforced, Since the prepit 21 of a one side wall can detect the groove 20 of a couple, and the track address of the land 30 and the prepit 21 can be formed easily, it is more advantageous to each side walls of the groove 20 than forming the prepit 21.

[0034]By having had composition which forms the prepit 21 in a field for exclusive use, and records a track address according to the optical disc of this embodiment which consists of such composition, When determining the width of the groove 20 and the land 30, it becomes unnecessary to take into consideration the amount of wobbling amplitude in conventional technology, and the width of the groove 20 and the land 30 can be formed narrowly. This can raise the storage density of the diameter direction of the optical disc 10.

[0035]Since the recording position of the information on the groove 20 and the land 30 and the formation position of the prepit 21 are changed, While an information signal and the regenerative signal of a track address do not interfere and being able to detect the stable track address at the time of reproduction of information, the stable information signal is renewable.

[0036]While being able to make the prepit 21 irradiate with a part of beams 41 and 42 for record/reproduction certainly by having made width of the groove 20 and the land 30 into 40% - 80% of the diameters of the beams 41 and 42 for record/reproduction, Width of the groove 20 and the land 30 can be narrowed, and densification of the optical disc 10 can be carried out more.

[0037]The optical disc of this invention is not limited to the embodiment mentioned above. For example, on the formation art of a groove, although it is somewhat difficult, it can also have composition which forms the prepit 21 in each side walls of the groove 20.

[0038]

[Effect of the Invention]As mentioned above, according to the optical disc of this invention, the detection of a track address, and the record/playback of information which could attain densification of information storage and was stabilized can be performed.

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[Translation done.]